

## CLAIMS

1) Composition for the treatment of articles made of textile fibres which is intended to be used for washing and/or rinsing, drying in a tumble dryer or ironing  
 5 articles made of textile fibres comprising at least one water-soluble or water-dispersible dendritic or hyperbranched polymer (P) capable of being obtained by:

(a) polycondensation of at least one multifunctional monomer of formula (I) comprising at least three reactive polycondensation functional groups,



10 in which formula

. f is an integer greater than or equal to 2, preferably ranging from 2 to 10, very particularly equal to 2,

. the symbol A represents a reactive functional group or a group carrying a reactive functional group chosen from the amino, carboxyl, hydroxyl, oxiranyl,  
 15 halo or isocyanato functional groups or their precursors,

. the symbol B represents a reactive functional group or a group carrying a reactive functional group chosen from the amino, carboxyl, hydroxyl, oxiranyl, halo or isocyanato functional groups or their precursors which is an antagonist of A,

20 . the symbol R represents a linear or branched aliphatic, cycloaliphatic or aromatic polyvalent hydrocarbon residue comprising from 1 to 50, preferably from 3 to 20, carbon atoms which is optionally interrupted by one or more oxygen, nitrogen, sulphur or phosphorus heteroatoms, the said residue optionally carrying functional groups not capable of reacting with the A and B  
 25 functional groups,

(b) and optionally at least partial hydrophilic functionalization of the polymer obtained in the polycondensation stage.

2) Composition according to Claim 1, characterized in that the said  
 30 polycondensation operation is carried out in addition in the presence

- of at least one bifunctional monomer in the linear form of formula (II) in the corresponding cyclic form comprising two reactive polycondensation/polymerization functional groups



35 in which formula

. the symbol A', which is identical to or different from A, represents a reactive functional group chosen from the amino, carboxyl, hydroxyl, oxiranyl, halo or isocyanato functional groups or their precursors which is an antagonist of B and B',

5 . the symbol B', which is identical to or different from B, represents a reactive functional group chosen from the amino, carboxyl, hydroxyl, oxiranyl, halo or isocyanato functional groups or their precursors which is an antagonist of A and A',

10 . the symbol R', which is identical to or different from R, represents a linear or branched aliphatic, cycloaliphatic or aromatic polyvalent hydrocarbon residue comprising from 1 to 50, preferably from 3 to 20, carbon atoms which is optionally interrupted by one or more oxygen, nitrogen, sulphur or phosphorus heteroatoms, the said residue optionally carrying functional groups not capable of reacting with the A, A', B and B' functional groups,

15 \* the reactive functional group A' being capable of reacting with the B functional group and/or the B' functional group by condensation;

\* the reactive functional group B' being capable of reacting with the A functional group and/or the A' functional group by condensation;

20 • and/or of at least one "core" monomer of formula (III) comprising at least one functional group capable of reacting by condensation with the monomer of formula (I) and/or the monomer of formula (II)



in which formula

25 . n is an integer greater than or equal to 1, preferably ranging from 1 to 100, very particularly from 1 to 20,

. the symbol B'' represents a reactive functional group, identical to or different from B or B', chosen from the amino, carboxyl, hydroxyl, oxiranyl, halo or isocyanato functional groups or their precursors which is an antagonist of A and A',

30 . the symbol R<sup>1</sup> represents a linear or branched aliphatic, cycloaliphatic or aromatic polyvalent hydrocarbon residue comprising from 1 to 50, preferably from 3 to 20, carbon atoms which is optionally interrupted by one or more oxygen, nitrogen, sulphur or phosphorus heteroatoms or an organosiloxane or polyorganosiloxane residue, the said R<sup>1</sup> residue optionally carrying functional groups not capable of reacting with the A, A', B, B' and B'' functional groups,

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\* the reactive functional group B'' being capable of reacting with the A functional group and/or the A' functional group by condensation;

- and/or of at least one "chain-limiting" monofunctional monomer of formula (IV)



5 in which formula

. the symbol A'' represents a reactive functional group, identical to or different from A or A', chosen from the amino, carboxyl, hydroxyl, oxiranyl, halo or isocyanato functional groups or their precursors which is an antagonist of B, B' and B'',

10 . the symbol R<sup>2</sup> represents a linear or branched aliphatic, cycloaliphatic or aromatic polyvalent hydrocarbon residue comprising from 1 to 50, preferably from 3 to 20, carbon atoms which is optionally interrupted by one or more oxygen, nitrogen, sulphur or phosphorus heteroatoms or an organosiloxane or polyorganosiloxane residue, the said R<sup>2</sup> residue optionally carrying functional groups not capable of reacting with the A, A', A'', B, B' and B'' functional groups,

\* the reactive functional group A'' being capable of reacting with the B functional group and/or the B' functional group and/or the B'' functional group by condensation;

- 20 • at least one of the reactive functional groups of at least one of the monomers of formula (II), (III) or (IV) being capable of reacting with an antagonistic functional group of the multifunctional monomer of formula (I).

3) Composition according to Claim 2, characterized in that:

- 25 - the molar ratio of the monomer of formula (I) to the monomer of formula (II) is greater than 0.05 and preferably ranges from 0.125 to 2;
- the molar ratio of the monomer of formula (III) to the monomer of formula (I) is less than or equal to 1, preferably less than or equal to 1/2 and more preferably still ranges from 0 to 1/3; the said ratio ranges very particularly from 0 to 1/5;
- 30 - the molar ratio of the monomer of formula (IV) to the monomer of formula (I) is less than or equal to 10, preferably less than or equal to 5; the said ratio ranges very particularly from 0 to 2, when f is equal to 2.

4) Composition according to any one of Claims 1 to 3, characterized in that

35 the functional groups optionally present in the monomers (I) to (IV) and which are

not capable of reacting with the A, A', A'', B, B' and B'' functional groups are quaternary ammonium, nitrile, sulphonate, phosphonate or phosphate functional groups.

5            5) Composition according to any one of Claims 1 to 4, characterized in that the A, A', A'' and B, B', B'' functional groups are chosen from reactive functional groups or groups carrying reactive functional groups chosen from the amino, carboxyl, hydroxyl or oxiranyl functional groups or their precursors.

10           6) Composition according to Claim 5, characterized in that the said functional groups are chosen from reactive amino and carboxyl functional groups or groups carrying reactive amino and carboxyl functional groups or their precursors.

15           7) Composition according to Claim 6, characterized in that the dendritic polymer (P) employed is a hyperbranched polyamide obtained from at least one monomer of formula (I) exhibiting, as reactive polycondensation functional groups, amino functional groups and carboxyl antagonistic functional groups or from a monomer composition comprising in addition at least one monomer of formula (II)  
20           and/or (III) and/or (IV) exhibiting the same type(s) of reactive polycondensation functional group(s), it being possible for all or part of the monomer or monomers of formula (II) to be replaced by a lactam.

             8) Composition according to Claim 6 or 7, characterized in that the  
25           hyperbranched polyamide exhibits hydrophilic functionalities which do not react with the A, A', A'', B, B' and B'' functional groups and is capable of being obtained by employing a monomer of formula (III) and/or (IV) exhibiting one or more polyoxyethylene groups and/or a monomer of formula (IV) exhibiting quaternary ammonium, nitrile, sulphonate, phosphonate or phosphate functional groups.

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             9) Composition according to Claim 6 or 7, characterized in that the hyperbranched polyamide exhibits hydrophilic functionalities which do not react with the A, A', A'', B, B' and B'' functional groups and is capable of being obtained by polycondensation of nonfunctionalized monomers and then by modification of  
35           the end functional groups of the said hyperbranched polyamide by reaction with a

compound exhibiting quaternary ammonium, nitrile, sulphonate, phosphonate or phosphate functional groups or polyoxyethylene groups.

10) Composition according to any one of Claims 1 to 9, characterized in that  
5 the weight-average molar mass of the said dendritic polymers, in particular hyperbranched polyamides, ranges from 1000 to 1 000 000 g/mol, preferably from 5000 to 500 000 g/mol.

11) Composition according to any one of Claims 1 to 10, characterized in  
10 that it comprises from 0.001 to 10%, preferably from 0.01 to 5%, of its weight of the dendritic polymer (P).

12) Use, in a composition for the treatment of articles made of textile fibres which is intended to be employed for washing and/or rinsing, drying in a tumble  
15 dryer or ironing articles made of textile fibres, of at least one dendritic polymer (P), the definition of which is given in any one of Claims 1 to 10, as agent which makes it possible to contribute, to the said articles, antiwrinkling properties or ease-of-ironing properties.

20 13) Use according to Claim 12, characterized in that the said dendritic polymer (P) is employed in a proportion of 0.001 to 10%, preferably of 0.01 to 5%, by weight of the said composition.

14) Process for improving the properties of a composition which is intended  
25 for washing and/or rinsing, drying in a tumble dryer or ironing in an aqueous or wet medium articles made of textile fibres by addition to the said composition of at least one dendritic polymer (P), the definition of which is given in any one of Claims 1 to 10, in an amount which is effective in contributing, to the said articles, antiwrinkling properties or ease-of-ironing properties.

30 15) Process according to Claim 14, characterized in that the said dendritic polymer (P) is employed in a proportion of 0.001 to 10%, preferably of 0.01 to 5%, by weight of the said composition.

35 16) Composition according to any one of Claims 1 to 11, use according to

Claim 12 or 13 or process according to Claim 14 or 15, characterized in that the said composition is provided:

\* in the form of a solid or of a concentrated aqueous solution or dispersion intended to be brought into contact with the articles to be treated after dilution in water;

\* in the form of an aqueous solution or dispersion to be deposited directly on the dry articles to be treated without dilution;

\* in the form of an insoluble solid support comprising the said dendritic polymer brought into contact directly with the articles to be treated in the wet state.

17) Composition, use or process according to Claim 16, characterized in that the said composition is:

- a solid or liquid detergent formulation comprising from 0.001 to 5%, preferably from 0.1 to 2%, by weight of the dendritic polymer (P) capable of directly forming a detergent bath by dilution;

- a liquid rinsing formulation comprising from 0.001 to 5%, preferably from 0.01 to 2%, by weight of dendritic polymer (P) capable of directly forming a rinsing bath by dilution;

- a solid material, in particular a textile material, comprising from 0.001 to 10%, preferably from 0.01 to 5%, by weight of dendritic polymer (P) intended to be brought into contact with wet articles in a tumble dryer;

- an aqueous ironing formulation comprising from 0.001 to 5% by weight of dendritic polymer (P).